

**Title:** An exploration of how domains of quality of care relate to overall care experience

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## ABSTRACT

**Purpose:** To determine the relative influence of the different domains of healthcare quality from the Care Experience Feedback Improvement Tool and identify key predictors of healthcare quality from the patients' perspective. Measurement is necessary to determine whether quality of healthcare is improving. The Care Experience Feedback Improvement Tool was developed as a brief measure of patient experience. It is important to determine the relative influence of the different domains of healthcare quality to further clarify how the Care Experience Feedback Improvement Tool can be used and identify key predictors of healthcare quality from the patients' perspective.

**Methods:** 802 people with a healthcare experience during the previous 12 months were telephoned to complete the Care Experience Feedback Improvement Tool questions and an additional eleven-point global rating of patient experience. To estimate the influence of different domains of healthcare quality on patient overall ratings of quality of healthcare experience, we regressed the overall rating of patient experience with each component of quality (safety, effectiveness, timely, caring, enables system navigation and person-centred).

**Findings:** We found that all of the domains of the Care Experience Feedback Improvement Tool, influenced patient experience ratings of healthcare quality. Specifically, results show

the degree of influence, the impact of demographics and how high scores for overall rating of patient experience can be predicted.

**Originality:** Our findings suggest that all of the Care Experience Feedback Improvement Tool domains are important in terms of capturing the wholeness of the patient experience of healthcare quality to direct local quality improvement.

## **Background**

Despite global efforts to improve and assure the quality of health services, quality of care remains variable (Public Health England, 2016; Jha et al, 2005). That is, people do not receive high quality care every time (Zhan and Miller, 2003). It is argued that measuring and acting on issues of quality raised by patients can be a partial solution to this persistent challenge (Rathert et al, 2011). Measuring and acting on issues of quality raised by patients is now seen as an essential component of healthcare quality indicators globally (Health Foundation, 2013; Doyle et al, 2013; Aiken et al, 2012; Garratt, 2008). Patients, through their unique experiences, can offer insights into healthcare quality, which would be unseen from other perspectives such as the way a treatment, process or interaction has made them feel and subsequently, behave. Due to the complexity of healthcare systems, with many care transitions and multiple providers, patients are often the only people to view the quality of care holistically (Rathert et al, 2011).

Measuring the patient perspective is complex for two main reasons. Firstly, what constitutes 'quality of care' and the 'patient perspective' are difficult to conceptualise and measure (Coulter et al, 2009). Secondly, measurement tools to be used within healthcare contexts need to be brief to ensure their utility at the frontline of care. Historically, the patient perspective was measured using patient satisfaction surveys (Locker and Dunt, 1978). Patient satisfaction is "implicitly or explicitly defined as an evaluation based on the fulfilment of expectations" (Williams, 1994, p511). These expectations are influenced by patient's

experiences of healthcare including their own health status, whether they are currently receiving healthcare and if so, their dependency on healthcare providers (Coulter et al, 2009). Williams et al (1998) conclude that patient satisfaction may not necessarily correlate with a positive healthcare experience but may indeed reflect attitudes that health care staff are “doing all they can” or “it’s not really their job to do...”(p1358). Patient satisfaction surveys tend to lack sensitivity, often elicit very positive ratings and often do not ask patients about the value of their treatment, failing to discriminate effectively between practice that is good and bad (Coulter and Fitzpatrick, 2000). Methodological issues, such as high ceiling effects (responses clustered at high end of response options), have also emerged which can limit analysis and interpretation (Moret et al, 2007).

As an alternative to satisfaction, there is evidence to suggest that patient reports of their ‘experiences’ of healthcare more accurately represent accounts of healthcare quality (Health Foundation, 2013; Luxford, 2012; Salisbury et al, 2010). Also, asking patients questions relating to their experience has been deemed more useful for directing improvement efforts, as well as monitoring performance of healthcare quality (Jenkinson et al, 2002). Measuring patient experience requires questions to be designed around what and/or how often care processes or behaviours occurred, as opposed to patient ratings of care (Dr Foster Ltd, 2010). For example, instead of asking patients how satisfied they are with their medication, a patient experience tool might ask the frequency of receiving the right medicine at the right time. Rather than asking patients to make a judgement about aspects of their care, patient experience questions are designed to establish factual accounts of whether or how often care processes occurred. Therefore, quantifying the patient perspective should aim to measure patient ‘experience’ as opposed to ‘satisfaction’.

There is a plurality of perspectives of what constitutes healthcare quality. That is definitions of quality differ dependent upon the stakeholder (patient, clinician, manager) and the context

(Donabedian, 1988). To ensure measures of patient experience of healthcare quality are valid (measuring what they intend to) they need to capture a wide array of domains. Whilst interpretation of domains remain context specific, there is some consensus of identification of what constitutes a healthcare quality domain. For example, the widely accepted domains proposed by the Institute of Medicine (IOM), namely; care which is Safe, Timely, Efficient, Effective, Equitable and Patient-centred, referred to as 'STEEEP' (Institute of Medicine, 2001). Taking 'timely' as an example; in an outpatient setting, timely might be the length of time a patient has to wait for an appointment, whereas in a hospital setting, it may be interpreted as the length of the time the patient has waited for a test.

We have previously conducted a systematic review which critiqued existing tools to measure patient experience of hospital care (Beattie et al 2015). This review highlighted 11 instruments. Six of these, including the Picker Institute Survey (Picker Institute, 2012) and the Scottish inpatient Patient Experience Survey (Scottish Government, 2012), had extensive psychometric testing and were conducted annually to benchmark health providers and enable year-on-year comparisons. Whilst data from these surveys are useful to determine variations between health providers, it is not timely nor specific enough to capture patient experience of healthcare quality at the healthcare interface to direct local quality improvement (QI) efforts. For example, survey data may highlight a poor score in waiting time, but the data is usually only available at the level of providers (health care organisation) and, sometimes, facility (hospital, healthcare centre). Being unable to locate the problem to a local clinical team makes it impossible to target areas for improvement. Also, the stringent criteria for data sampling, collection and analysis required for National surveys often means that the data is not available to the healthcare team for up to a year after the patient experience.

The other five instruments were designed for quality improvement purposes and did demonstrate some degree of reliability and validity. There were however issues with their transferability. For example, the Patient Experiences with Inpatient Care (I-PAHC) (Webster et al, 2007) and the Patient Perception of Quality surveys (Rao et al, 2006) were developed in non-western, low-income healthcare settings and included items such as medicine availability. They were also lengthy, which limits their use by hard-pressed clinical teams as an ongoing method of measurement for improvement within clinical areas (Wilde et al, 1994; Larsson and Larsson, 2002; Pettersen et al 2004, Webster et al, 2011; Rao et al, 2006).

The Care Experience Feedback Improvement Tool (CEFIT) was developed to fill this existing gap - a brief and timely measure of patient experience of healthcare quality suitable for use at the clinical coalface. Full details of the CEFIT development are available at Beattie et al (2016). Briefly, a model was devised from the literature and patients experience. The model suggested quality of care as being composed of six domains, namely care which is; safe, effective, timely, caring, enables system navigation and is enacted in a person-centred way (Beattie et al, 2016; Beattie et al 2012). A person-centred statement was devised for each domain, as person-centred care was found to be foundational to all other domains. There are difficulties ensuring that a short tool such as CEFIT can sufficiently measure the complexity of the patient experience of hospital quality of care (validity), whilst ensuring the brevity of CEFIT to enable ongoing measurement of improvement. However, our previous paper (Beattie et al 2016) found that the CEFIT structure is measuring the patient experience of quality of care sufficiently and is doing so in a consistent manner. By testing internal consistency reliability and interitem correlations, we have confirmed the need for five components which are clearly inter-related, yet unique enough to require their own component. Also a Cronbachs alpha of 0.78 provides reassurance of the reliability of the instrument and confirms that sufficiency of the tool. CEFIT was originally intended for use in a hospital context, but the domains are generic to

all healthcare contexts. Initial psychometric testing has found CEFIT to be structurally valid and internally consistent (Beattie et al, 2016). A valid, reliable and brief measure of patient experience is likely to more accurately reflect the quality of healthcare experienced locally by patients, as opposed to pooled data lacking discrimination of location. Data from such a brief instrument as CEFIT would be more amenable to providing a measure of ongoing improvement efforts in comparison to lengthy national surveys which do little to reveal local trends over time.

It is important to determine the relative influence of the different domains of healthcare quality to establish an effective way to score CEFIT and identify key predictors of healthcare quality from the patients' perspective. Establishing the importance of domains of healthcare quality could inform what and how the patient experience of healthcare quality is measured. For example, when scoring patient experience using quantitative tools, domains of quality which are more important to patients might need to be weighted accordingly. Identifying key predictors of patient experience of quality of care can help direct resource for quality improvement. It is also important to establish whether or not an overall rating question is helpful to measure the patient experience.

## Methods

The aim of this study was to explore the relationships that exist between individual quality indicators and overall care experience and identify key predictors of healthcare quality from the patients' perspective. The research questions to be addressed were:

1. What domains of quality are the main predictors of how an individual rates patient experience?

2. Which domains of quality (if any) are significant in predicting a high/low rating for patient experience?
3. Do patients tend to score the domains of quality similarly and how independent are they?

## Design

CEFIT was embedded within an existing population survey, namely the 2014 Queensland Social Survey (QSS) (Queensland Survey, 2014). This survey of households in the state of Queensland enables researchers to explore a wide range of research topics in a structured research framework. Whilst there are limitations to embedding CEFIT within a population survey (discussed further under limitations) it enabled a sufficient method to ensure an adequate sample to perform regression analysis. The target population for this telephone survey was persons 18 years or older living in Queensland, Australia. The sample was drawn using a computer program to select, with replacement, a simple random sample of telephone numbers. Within each household, one eligible person was selected based on age, gender and availability of the respondent for interview. The survey estimates of sampling error for the total sample of 1,223 showed this was accurate within  $\pm 2.8$  percentage points (at the 95% CI). The most recent Australian Bureau of statistics (ABS) census data was used for comparison with the 2014 QSS.

## Measures

The 2014 QSS contained questions regarding a number of socio-demographic characteristics including age, gender, BMI, address, level of education and income. We added the five item CEFIT survey, with both a preceding screening question and overall rating question (Appendix 1). The preceding screening question identified participants who had experienced a recent (within 12 months) healthcare experience. The overall rating question consisted of an additional eleven-point global rating of patient experience, with

responses ranging from zero to ten, where ten is the best experience possible and zero is the worst.

## **Data analysis**

Data analysis was performed using Stata Intercooled v13. Statistical significance was represented by a P value of  $<0.05$ . The analysis of the data consisted of the following:

- Data cleansing was initially performed such that any responses of “don’t know/unsure” and “no response” were removed from the data set prior to analysis.
- As all variables being analysed are categorical, ordinal logistic regression was conducted to establish the presence of statistically significant influence.
- Interactions between quality indicators were explored using regression analysis and a review of variance inflation factors was conducted to ensure a reasonable level of independence between variables.

The aim of the analysis was to determine the nature of the relationship between the five domains of quality in the CEFIT measure and overall care experience. In order to address this, three sub-analyses were conducted: analysis of the relationship between each quality domain and overall care experience; analysis of the key predictors of a lower half / upper half score for overall care experience; and analysis of the level of independence between each quality domain. The corresponding results are presented below.

## **Results**

The overall Queensland survey response rate for the QSS was 35.9% with 1223 interviews. Of the 802 participants eligible to answer the CEFIT questions (i.e. those that reported a healthcare experience within the preceding 12 months) there was a 100% response rate.



The demographic details of these participants is shown in table 1.

### **Independence of the quality domains**

Prior to conducting analysis of the influence of each predictor (explanatory) variable on the dependent variable, a regression analysis was conducted to assess levels of multicollinearity between the variables. Regression analysis between each variable was performed and the variation inflation factors (VIFs) assessed. The variation inflation factors for each independent variable are presented in Table 2: Correlation between independent variables. Given variance inflation factors (VIF)  $\leq 2.47$  indicating that standard errors are larger by a factor of at most 2.47, we can conclude that the level of multicollinearity between variables is acceptable and there are not high levels of association between the independent variables. This finding allows us to be confident in assessing each individual predictor variable's influence on the dependent variable, knowing that the variable is not overly influenced by the presence of the other predictor variables. It allows us to clearly identify the level of influence each domain variable has on overall care experience.

### **Relationship between quality domains and overall care experience**

In this unadjusted model, the overall care experience was the dependent variable (DV) and the 5 quality indicators the predictor (explanatory) variables (see Table 3: Ordinal logistical regression on overall experience). Each predictor variable was individually regressed on overall care experience. Findings show that all quality indicators were significantly associated with a positive care experience. In other words, expressing some degree of positive experience of each of the quality indicators is associated with an increase in odds of a comparatively positive rating for overall care experience.

In the adjusted model all predictor variables were included in the model (see Table 3: Ordinal logistical regression on overall experience). Each predictor variable was individually regressed on overall care experience while all other quality indicators were controlled (held constant). In this model the results show only *timely care*, *care that met personal needs* and *able to get the care I needed* remained significant predictors of overall care experience. In other words, each of these quality indicators were independently associated with overall quality experience when all other quality indicators were controlled. Expressing some degree of positive experience of each of these 3 quality indicators is associated with an increase in the odds of a positive rating for overall care experience.

### **Impact of other factors**

Analysis was conducted to assess whether someone's social-demographic status influenced their response to the questions asked. The social-demographic data collected comprised of age, gender, BMI, address, level of education and income. Of these, only age showed some statistical significance as a predictor of the responses given to the quality domain questions. The age variable was dichotomised to  $\leq 50$  (0) versus  $> 50$  (1). The results are presented in Table 4: Ordinal logistical regression on each quality indicator, predictor variable age.

The predictor variable age was regressed on each quality indicator. As the results show, age is significantly associated with all quality indicators. In other words, over 50s are associated with increased odds of higher scores for each quality indicator. Analysis was also conducted to identify if age was a predictor of overall care, however no significant results were found.

### **Predictors of lower/upper half score for overall care experience**

The dependent variable overall care experience was dichotomised to 0-5 (0) 6-10 (1) to represent a lower and upper score for overall care experience respectively. In the adjusted

model (Table 5: Ordinal logistical regression on overall care experience) all predictor variables were included in the model. Each predictor variable was individually regressed on overall care experience while all other quality indicators were controlled (held constant). In this model the results show only *receiving the care that met personal needs* and *getting the care you needed* were regarded as significant predictors of high scores for overall care experience. In other words, these two quality indicators were independently associated with overall quality experience when all other quality indicators were controlled. Expressing some degree of positive experience of each of these 2 quality indicators is associated with an increase in the odds of a high score for overall care experience.

## Discussion

This study examined the relative influence of the CEFIT domains of healthcare quality on patients' experience of quality of care. Our study found that all of the domains of CEFIT, namely; safe, effective, timely, caring, system navigation and person-centred were predictors of how patients rated their experience of healthcare quality. There was some variation in the degree of influence of the domains on participants overall ratings of healthcare experience. For example, in order of the significance, when all quality indicators were assessed together, *receiving timely care* (time), *care that met my personal needs* (effective) and *getting the care I needed when I needed it* (system navigation) were significant predictors of how participants scored their overall rating of healthcare quality experience. However, given that all domains of quality were significantly associated with a positive care experience when assessed individually, there remains a need to consider all of these aspects when examining healthcare quality from those in receipt of healthcare.

When devising and or selecting a patient experience tool it is important to consider the purpose of the data collected. For example, patient experience data which is to be used for high stakes purposes, such as league tables for healthcare organisations or where scores are rewarded with financial remuneration, require robustly developed surveys. These surveys warrant the resource implications of standardised inclusion criteria, adjustment for patient types (i.e. illness severity) and other known confounding variables. However, a patient experience tool required to direct local quality improvement work requires other important considerations, such as the brevity of the tool to enable repeated measures over time (i.e. monthly data collection) and to be fit for purpose by frontline staff (no complex statistical calculations). That is not to say that tools to be used for local QI do not need to be robust, but rather there is an important balancing act between robustness and usefulness. Therefore, even though the degree of influence of each quality domain varied, there is no need for complex adjustments to be made to CEFIT scoring (such as weighting) for two reasons. Firstly, the results of this study show that despite variations in degrees of influence all quality domains were important to patient experience, and secondly, weighting would compromise the utility of the tool whilst adding little robust value.

Similarly, the domains of quality were not found to be significantly dependent on each other. This suggests that each domain is necessary in terms of capturing the wholeness of the patient experience of healthcare quality. This also suggests that an overall rating score is not necessary, rather each indicator is important and the more appropriate way to score CEFIT is a collective score of all domains as opposed to an overall rating score.

The model of healthcare quality which influenced the development of CEFIT found that person-centred care was not an independent domain, but rather foundational to all other domains (Beattie et al, 2016). For example, *effective* care can only be achieved if the evidence for treatment is adjusted to the patients' personal circumstances, such as

medication dose adjustment due to other medical conditions. The way in which the effectiveness of treatment options is explained to the patient is paramount to the patient experience of healthcare quality. The non-technical skills and behaviours of healthcare professionals remained fundamental to the participants' judgement of healthcare quality. This is consistent with other studies which have examined predictors of healthcare quality from the patient perspective (Jenkinson et al, 2002; Attree, 2001). A qualitative study exploring the key factors of good nursing care identified five key themes, which were similar to those in CEFIT (Larrabee and Bolden, 2001). They summarised these themes of good care as: Providing for my needs; treating me pleasantly; caring about me; being competent and providing prompt care. Examining patient's experiences of care received would clearly help healthcare professionals reflect on the care they provide and also assist them to design appropriate care plans and perhaps make modifications to the services they deliver. Ahmad and Alasad (2004) suggest that when a patient has a positive interaction with healthcare staff, this will also be positive for the staff and the organisation in which they work.

Over 150 years ago Florence Nightingale advocated that caring attitudes and behaviour were fundamental to quality of care (Meyer and Bishop, 2007). Good communication skills, empathy and caring appear to be the strongest predictor's of how a patient will evaluate the care they have received. Attree (2001) concluded that patients described 'good quality care' as individualised and patient-focused through the presence of a caring relationship.

Receiving what patients described as 'good quality care' enhanced a feeling of being genuinely cared for and about. This in turn facilitated trust and confidence between the patient and their health care professional. Irurita (1999) highlighted the relationship between nursing staff and patients as being central to the quality of care patients perceived they had received. More recent studies have also highlighted the importance of caring behaviours as essential elements of quality of healthcare (Haggerty et al, 2007; Barelds et al, 2009, Mohammed et al, 2016). Caring behaviours have been found to be key domains within other patient experience of healthcare quality instruments, namely HCAHPS (Centers for Medicare

and Medicaid, 2013), QPP (Wilde et al, 1994), PPEQ (Wong et al, 2013), NHS IP (Picker Institute, 2012), SIPES (Scottish Government, 2012), HKIEQ (Wong et al, 2013), PEQ (Pettersen et al, 2004), NORPEQ (Olstedal et al, 2007), I-PAHC (Webster et al, 2011), and PPQ (Rao et al, 2006).

Our analyses also found that age was the only social-demographic factor influencing participants' scores of healthcare quality. Specifically, an increase in age was associated with an increase in positive ratings of healthcare quality. This finding is supported in the literature (Thi et al, 2002; Hargreaves et al, 2012; Xesfingi and Vozikis, 2016). Other demographic variables such as gender, BMI, address, level of education and income had no influence over scores of healthcare quality. Other studies have found an association between gender and healthcare quality; finding that men tend to be more satisfied with their care than women (Ahmad and Alasad, 2004; Thi et al, 2002). Men's overall ratings of healthcare experience have been found to be influenced by how well their pain control is managed, whereas women's ratings are associated with behavioural aspects of clinical staff (Hargreaves et al, 2012). Education has also been found to influence patient experience ratings of healthcare plans (Damman et al, 2009). We did not find any relationship between participant's education and patient experience. This may be due to differences in how patients evaluate healthcare plans, as opposed to care experience.

Even when tools are not being used to measure patient experience, identifying aspects of quality which are more likely to predict a positive patient experience in healthcare can be valuable. For example, our findings suggest the importance of waiting time, receipt of effective care and the ability to navigate the healthcare system as important predictors of their overall care experience. It is likely that the importance of these predictors also change as healthcare evolves. For example, waiting times may have re-emerged as important recently with the international financial challenges of balancing cost and quality. Similarly, as healthcare becomes increasingly complex, due to advances in treatment and an increase

in specialists, the ability of patients to navigate healthcare becomes more challenging. Acting on aspects of quality which are important to patients could help direct limited resources to improve healthcare quality.

## **Limitations**

The nature of a population survey confines the results to those with a generic recent healthcare experience in an Australian population. This method does not take account of variations in how people from differing healthcare contexts (i.e. hospital or community/family practitioner) or location (i.e. urban, rural, less affluent areas) may have interpreted the CEFIT questions. The survey enabled access to a sample adequate for ordinal (multiple) logistic regression and the findings suggest the robustness of CEFIT to warrant the necessary resource for large scale testing in an inpatient environment.

## **Implications for policy, practice and future research**

Establishing the importance of domains of healthcare quality could inform what and how the patient experience of healthcare quality is measured. Our analysis shows that all domains in the CEFIT were important to the patient experience of quality of healthcare, therefore complex statistical weighting of specific domains are not required. Rather, each domain is of value particularly when enacted in a person-centred way. As with any new tool, additional research will be required to determine its utility over time. **However, a brief instrument such as CEFIT, which can be completed quickly is clearly needed for improvement purposes within ward and clinical environments. Previous lengthy surveys are likely to be a burden to both patients and clinicians and unsuitable for repeated measurements at the frontline of care. Diverting resources from care delivery to care measurement is likely to negatively affect the very concept we are trying to improve – quality of care.** Further validation work is clearly required within an inpatient population to establish whether CEFIT captures the

patient experience of hospital quality. In the future we believe that CEFIT would be useful for problem identification to direct improvement efforts but are aware that this may need to be supplemented with additional qualitative data. CEFIT is not intended to discriminate reliably between care providers but rather measure local improvement over time. A future study examining the responsiveness of CEFIT in a specified context (i.e. hospital) is needed.

## **Conclusion**

Understanding patients' views on their experiences of healthcare is essential for any service to be improved. Identifying those domains of quality that promote a positive experience will help healthcare professionals provide improved care. Despite the evolutionary nature of healthcare, caring behaviours of healthcare staff appear to be pivotal in patients' evaluations of healthcare quality. Overall CEFIT has shown promise as a tool for patients' evaluation of their healthcare experience. CEFIT has been designed for improvement purposes (i.e. brevity) and this study has allowed us to test out the tool in a range of healthcare settings. Future work will focus specifically on use of the tool at a ward/team level and explore its potential as a means of understanding the domains of quality contributing to a positive experience in such a setting.

## **Declaration**

The authors declare that they have no competing interests.

## **List of abbreviations**

HCAHPS - Hospital Consumer Assessment of Healthcare Providers and Systems

QPP - Quality from the Patients' Perspective



PPE-15 - Picker Patient Experience Questionnaire

NHSIP – National Health Service Inpatient Survey

SIPES - Scottish Inpatient Patient Experience Survey

HKIEQ - Hong Kong Inpatient Experience Questionnaire

PEQ - Patient Experience Questionnaire

NORPEQ - Norwegian Patient Experience Questionnaire

I-PAHC - Patient Experiences with Inpatient Care

PPQ - Patient Perceptions of Quality

### **Ethical approval and consent to participate**

Ethics approval was sought and approved by the Human Ethics Review Panel Central Queensland University (Reference H13/06-120).

### **Competing interests**

The authors declare that they have no competing interest

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The University of Stirling provided funding to embed the CEFIT questions within the Queensland Annual Social Survey.

### **Authors' contributions**

AS – Devised study, developed paper

MB – Devised Quality questions, developed paper

JC – Analysed data, developed paper

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Table 1: Demographics of sample (n=802) who answered CEFIT questions

Demographic Variable		%
<b><i>Marital Status</i></b>		
Single		11
Widowed		6.7
Divorced		6.9
Separated		2.4
Married		67.3
De facto		5.7
<b><i>Gender</i></b>		
Male		50.5
Female		49.5
<b><i>Age</i></b>		
Mean (standard deviation)	57.8 (15.7)	
<b><i>Country of birth</i></b>		
Australia		79.1
rest of world		20.9
<b><i>Years of education</i></b>		
1-10 years		24.3
11-12 years		20.8
13-14 years		12.6
15+ years		42.3
<b><i>Employment status</i></b>		
Employed full time		35.3
Employed part time/casual		17.1
Unemployed		5.1
Retired/pensioner		38.1
Student		1.1
Home duties		3.3
<b><i>Household income category</i></b>		
Nil-\$26,000		13.0
\$26,001 - \$52,000		11.8
\$52,001 - \$100,000		15.7
Greater than \$100,000		23.6
Did not report income		35.9

**Table 2** Correlation between independent variables

Quality domains	VIF
Safe care (Qi1)	1.38
Timely care (Qi2)	1.26
Met your personal needs (Qi3)	2.47
Caring staff (Qi4)	2.11
Got care you needed (Qi5)	2.47

**Table 3** Ordinal logistical regression on overall care experience

	Unadjusted model OR (95% CI)	# obs	Adjusted model OR (95% CI)
did you receive safe care (Qi1)	<b>2.38 (1.86 to 3.04)</b>	789	1.06 (0.81 to 1.38)
did you receive timely care (Qi2)	<b>2.09 (1.80 to 2.42)</b>	797	<b>1.52 (1.30 to 1.79)</b>
did you receive care that met your personal needs (Qi3)	<b>4.27 (3.42 to 5.33)</b>	799	<b>2.00 (1.47 to 2.72)</b>
did you experience staff that were caring towards you (Qi4)	<b>5.29 (3.98 to 7.03)</b>	799	1.36 (0.92 to 2.00)
were you able to get the care you needed (Qi5)	<b>4.79 (3.74 to 6.13)</b>	799	<b>2.10 (1.49 to 2.93)</b>

Bold p value of <0.05

# obs = 787 for Adjusted model

Prob > chi2 = 0.00

**Table 4** Ordinal logistical regression on each quality indicator, predictor variable age

	# obs	OR (95% CI)	Prob > chi <sup>2</sup>
did you receive safe care (Qi1)	790	<b>1.72 (1.03 to 2.86)</b>	0.04
did you receive timely care (Qi2)	799	<b>2.35 (1.70 to 3.26)</b>	0.00
did you receive care that met your personal needs (Qi3)	800	<b>2.10 (1.40 to 3.14)</b>	0.00
did you experience staff that were caring towards you (Qi4)	801	<b>2.22 (1.38 to 3.56)</b>	0.00
were you able to get the care you needed (Qi5)	801	<b>1.81 (1.13 to 2.91)</b>	0.01

Bold p value of &lt;0.05

**Table 5** Ordinal logistical regression on overall care experience

	Adjusted model
	OR (95% CI)
did you receive safe care (Qi1)	0.73 (0.42 to 1.27)
did you receive timely care (Qi2)	1.42 (0.96 to 2.10)
did you receive care that met your personal needs (Qi3)	<b>2.31 (1.40 to 3.81)</b>
did you experience staff that were caring towards you (Qi4)	0.84 (0.47 to 1.54)
were you able to get the care you needed (Qi5)	<b>2.85 (1.73 to 4.69)</b>

Bold p value of <0.05

# obs 788 for Adjusted model

Prob > chi2 = 0.00